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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|----------------------|------------------|
| 10/620,388 | 07/17/2003 | Hajime Ikuno | 240441US0 | 9623 |
| 22850 | 7590 | 04/06/2006 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. | | | MORILLO, JANEL COMBS | |
| 1940 DUKE STREET | | | ART UNIT | |
| ALEXANDRIA, VA 22314 | | | PAPER NUMBER | |

1742

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/620,388 | IKUNO ET AL. | |
| | Examiner | Art Unit | |
| | Janelle Combs-Morillo | 1742 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-6,15,18,19,26,29-31 and 34-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-6,15,18,19,26,29-31 and 34-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) . Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The indicated allowability of claims 37 and 38 (which have been introduced into independent claims) is withdrawn in view of the newly discovered reference(s) to WO'772. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4-6, 15, 18, 19, 26, 29-31, 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (US 4,434,014) in view of WO00/71772 (WO'772) and "Aluminum Standards and data 2003" p 1-6.

Smith teaches a high strength and wear resistant aluminum alloy suitable for components in engines, including pistons (abstract). Said alloy comprises (in wt%): 12-15% Si, 1.5-5.5% Cu, 1-3% Ni, preferably 0.1-0.5% Fe, 0.01-0.1% Ti, 0.1-1% Mg, 0.01-0.1% Zr, 0.1-0.8% Mn, which overlaps or touches the boundary of the presently claimed ranges of Si, Cu, Ni, Fe, Mg, Zr, and Mn (cl. 1, 15, 26). Smith teaches 0.001-0.1% of a modifier is present, but does not specify P (cl. 1, 15, 26, 31) or Ca (cl. 4, 18, 29, 34). Smith does not teach the instant ranges of Ti or V are present.

Though Smith does not teach the instant ranges of Ti and V are present in said alloy, WO'772 teaches the addition of 0.05-1.2% Ti and 0.05-1.2% V to similar Al-Si-Cu alloys, and

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that said additions form intermetallic compounds thereby refining the grain structure, and also function as dispersion strengtheners (WO'772 at p 7-8). It would have been obvious to one of ordinary skill in the art to add V and Ti to the alloy taught by Smith, because WO'772 teaches that said addition improves high temperature tensile strength (p 8).

Concerning the instant ranges of P and Ca, "Aluminum Standards and data 2003" p 1-6 teaches Na, Sr, Ca, and/or P are added to 3xx and 4xx type Al-Si foundry alloys in order to modify the structure. "Aluminum Standards and data 2003" teaches 0.005-0.15% Ca and $\leq 0.060\%$ P are effective modifiers. It would have been obvious to one of ordinary skill in the art to use Ca and P as modifiers for the Al-Si alloy taught by Smith, because Smith teaches that 0.001-0.1% of a modifier is present (Smith at cl. 1), and "Aluminum Standards and data 2003" teaches 0.005-0.15% Ca and $\leq 0.060\%$ P are effective modifiers for 3xx series Al-Si alloys.

Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility.

Concerning claims 5, 15, 35, which mention the "pre-use" Vickers hardness, Smith teaches said alloy has excellent strength and hardness (see BHN, Brinell Hardness, Table 3). The examiner consulted a variety of handbooks and metallurgy texts, but was unable to locate a conversion scale from BHN to Vickers hardness. However, where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA

1977). Because the prior art teaches a substantially overlapping alloy composition, wherein said alloy is processed in a similar method of casting and heat treating (see examples of Smith), the properties applicant discloses and/or claims (such as Vickers hardness) are expected to be present. See MPEP 2112.01.

Concerning claims 6, 19, 30, 36, which mention “wherein size of non-metal inclusion existing within the piston is less than 100 μm ”, because the alloy taught by Smith substantially overlaps the presently claimed alloy composition (as well as being processed by a similar method of casting and heat treating), then substantially the same non-metal inclusions are expected to be present (see discussion above). Additionally, the examiner points out that said claims are not drawn to *all* inclusions, or *an average*, etc., but said limitation is met by one non-metal inclusion being $\leq 100 \mu\text{m}$.

Response to Amendment

4. In the response filed on March 7, 2006 applicant amended claim 1, 15, 20, 26, 31, canceled claims 2-3, 8-9, 16-17, 21-22, 27-28, 32-33, 37-38, and submitted various arguments traversing the rejections of record.
5. Applicant's arguments with respect to instant claims have been considered but are moot in view of the new ground(s) of rejection.
6. As stated above, the indicated allowability of claims 37 and 38 (which have been introduced into independent claims) is withdrawn in view of the newly discovered reference(s) to WO'772.


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Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCM 
April 5, 2006

ROY KING 
SUPERVISOR, PATENT EXAMINER
TECHNICAL CENTER 1700